R A D I O S H A C K

X E N I X

I S A M R E C O V E R Y P R O G R A M

Version 2.ØØ.ØØ

Catalog #FC-129

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WARNING

FOR THE INTERNAL USE OF RADIO SHACK PERSONNEL ONLY !!

IMPORTANT NOTE

PLEASE READ the notes on PAGE 22 BEFORE PROCEEDING FURTHER

PURPOSE OF THIS PROGRAM

The purpose of this program is to provide Radio Shack personnel with a means of recovering COBOL ISAM data files for selected XENIX application packages.

This program provides all that is needed to recover a damaged ISAM file.

Typical symptoms of a crashed ISAM file include error 98, and "missing" or "duplicate" records.

The user of this program needs only to place all the data files (not just the crashed ones) for each program to be recovered onto a primary hard drive in the default /Dta.Ø1 directories.

The following is a complete list of XENIX COBOL based packages for which this program has recovery routines. A list of required data files for each program is on pages 12 thru 14.

XENIX PACKAGE	CATALOG #
ACCOUNTS PAYABLE	26-62Ø5
ACCOUNTS RECEIVABLE	26-62Ø4
GENERAL LEDGER	26-62Ø1
INVENTORY CONTROL	26-63Ø2
JOB COSTING	26-62Ø9
MANUFACTURING INVENTORY	26-63Ø9
ORDER ENTRY	26-62Ø7
PAYROLL	26-62Ø3

ONLY THE ABOVE INDICATED PACKAGES CAN BE RECOVERED by means of this program. If a package does not appear in the above list, your customer's only recourse is either use of known valid backups or total re-entry of data (start over).

It must be stressed, once more, that this program is ONLY FOR USE BY RADIO SHACK PERSONNEL. No other use of this program is supported under any circumstances.

DESIGN OF THE PROGRAM

The program has the following requirements:

1. The use of an 8meg, 12meg or 15 meg primary hard drive.

2. The use of TRS-XENIX versions 1.2 or 1.3.

3. The use of a 256K Mod 16, 16b, or upgraded II/12, printer, & DT-1.

4. BEFORE installing this system, the MINIMUM amount of free space on the hard drive must be of the order of 2ØØØ free blocks (1 meg).

5. Before running a recovery, there must be enough free blocks to accommodate all the customer's data files, PLUS, enough EXTRA free space to accommodate the recovery program's scratch files which will require at least as much room as the largest customer data file.

6. ALL the data files for the customer's application package MUST be present on the primary hard drive in the appropriate /Dta.Ø1 directory before the program begins, because ALL the data files will be processed. The program may abort if one or more data files is missing. In that case, the program would then need to be started from the beginning again.

A list of required ISAM data files for each program is on pages 12 thru 14.

7. The amount of time for any one ISAM recovery run will depend on the number of ISAM files in the package, and the number of records in each data file. It is possible on very very large data files for the recovery to take several days.

8. This program REQUIRES the use of a PRINTER.

9. Some data files will often give problems after the recovery. A CLEANUP utility program is included for these and all other data files.

RESTRICTIONS OF THE RECOVERY PROGRAM

The following restrictions apply to this program.

1. This program runs on TRS-XENIX 1.2 or 1.3 with RUNCOBOL version 1.Ø8.ØØ.

2. Requires the use of a XENIX hard drive, DT-1 terminal, and a 132 column printer.

3. ALL data files for each program requiring recovery must be present on the hard drive in the appropriate /Dta.Ø1 directory before the running of the program.

4. The program will run ONLY on a primary hard drive.

5. The program can only be run by root from the console, as a foreground task.

6. No attempt should be made to run any of the XENIX-based COBOL application packages from another terminal during the running of either SAVEISAM or CLEANUP.

7. SAVEISAM & CLEANUP cannot be used at the same time.

8. A DT-1 should be enabled, logged in as root and at the root prompt, before starting the program on the console. This will allow you to exit "gracefully" in the event of a "crash".

9. This program is authorized ONLY for use by RADIO SHACK personnel.

1Ø. It is recommended that the operator of this program should have some familiarity with XENIX file handling utilities, to and from the various floppy formats, and with such disk utilities as cat, cd, chmod, copy, cp, df, kill, l, more, mv, ps, pwd, rm, etc.

INSTALLATION OF THE RECOVERY PROGRAM

1. Bootup the system under XENIX hard disk control.

2. Answer the date prompts, etc, then login as root.

3. Ensure you are at the root directory by typing:

pwd <enter>
the response should be "/" only.

4. The TRS-XENIX install disk marked "SAVEISAM", that accompanies this manual, should be placed in floppy drive Ø.

5. At root prompt (#) type:

install <enter>
1 <enter>
1 <enter>

This will place all the appropriate SAVEISAM modules on the primary hard drive in the appropriate directories.

q <enter>
will give you a prompt to remove the disk in drive Ø. Remove the SAVEISAM disk. Place the CLEANUP disk in drive Ø and press <enter>. You are now back at the xenix installation menu, so to install the CLEANUP programs type:

1 <enter>
1 <enter>

This will place all the appropriate CLEANUP modules in the appropriate directories.

q <enter>
Remove the CLEANUP disk. If you wish to install data files for AP, AR & GL, then change disks and follow the previous instructions. Use q <enter> to return to the root prompt.

6. If not already on the hard disk, you must get a copy of RUNCOBOL version 1.Ø8.ØØ onto hard drive Ø.

** NOTE ** each of the 3 disks has its own install script, so they can, if needed, be installed separately.

LEARNING & TESTING THE RECOVERY PROGRAM

Before committing any customer's files to the recovery process, be sure to familiarize yourself with the program and the way it runs.

Some sample data files have been included in the installation set, for you to practice on.

The following is a sample session:

1. PREPARATION
Check that the requirements specified under "DESIGN OF THE PROGRAM" and "RESTRICTIONS OF THE RECOVERY PROGRAM" can be met (page 3 & 4).

2. INSTALLATION
Follow the installation instructions (page 5).

3. BACKUP
Make certain that data files currently on the hard disk are backed up before copying over them with the sample data; previous data will be lost during the process of installing them.

4. PLACE DATA FILES ON PRIMARY DRIVE
Check printer to be certain it is on-line and ready to go. This will normally be the point at which you place the customer's data into the default directory for the package. We will recover the files from GL and AP in this session, so to obtain hard copy of the directory entries type:

```
l /Dta.Øl/Gl/* ¦ lpr <enter>
l /Dta.Øl/Ap/* ¦ lpr <enter>
```

Be extremely careful not to muddle up previous copies of the files with the customer's files. It is a good idea, therefore, to remove old copies BEFORE installing customer files with the following:

```
rm /Dta.Øl/Ar/*
```

or with any other appropriate method.

*** N O T E ***

When handling customer's data, you will need to check the disk format. Instructions will need to be appropriate to the customer's disk format.

5. EXECUTE RECOVERY PROGRAM
Ensure that you are logged in as root at the root prompt, at the console, in the root directory, and with an active DT-1 terminal at hand, turn CAPS ON, then type:

SAVEISAM <enter>

The screen will show a title and version number, followed by brief instructions and warnings.

C
is required input. You are prompted to enter a name for your customer before you get to the menu screen.

The break key is disabled from this point on.

6. MENU
At the menu you may type:

Q <enter> to exit to XENIX
or the 3 character code of the package to be recovered. In this sample session type:

GLX
This will set in motion the recovery of ALL the ISAM data files associated with the Gl XENIX package 26-62Ø1.
The screen will show you which file is being worked on, and what stage of the process the program is at. A file will record how many ISAM records were recoverable from the data. To see this file, go to the DT-l and type:

more /tmporary.fil <enter>

You should see a file containing your customer name and present details of the recovery process. Again on the DT-1, type:

l /t* <enter>

this should list the directory entries of all files in the root directory beginning with t. We are interested in /tmporary.fil because it is our audit trail and /tmporary.dta because it is one of our scratch files.

.dta will grow as any one file is processed normally, and will be reused (shortened) as another file is processed.

.fil will grow in length as each file is finished. Type l /t* <enter> a few more times to get the idea, and more /tmporary.fil <enter> when you see that file has grown.

Familiarizing yourself with this pattern will help you out in case of difficulty (see page 11).

The number of XENIX records in a file will not reflect the number of bytes shown to be in the XENIX directory for that file.

When the program has been through each one of the ISAM files for GL, it will return you to the MENU where you can either <Q>uit or type in another 3 character code for the next package. Since we have Ap 26-62Ø4 out there still to be recovered, type:

APX

This will recover the AP files, then return to the MENU again.

At the prompt ENTER SELECTION ===> type:

Q <enter>

to return to the XENIX prompt. /tmporary.fil will be spooled to the printer for your audit trail. In practice, you may recover for one customer as many programs as are needed in one shot.

It will not recover two customer's GL in the same round, nor is it advisable to have data from two customers being recovered at the same time.

7. RETURN DATA FILES
You have the directory print-out of the files before recovery. Use the appropriate commands to return the files to floppy disk. Use fresh disks, storing the original disks and the associated print-outs in a suspense file for a few weeks.

8. CAUTION
In most cases, the customer's files will now have good ISAM links, but some records may have been dropped and need to be re-added by the customer. Also, some records may now have good keys, but the data may be wrong and need editing as appropriate by the relevant package module. Eight specific data files will very often contain garbage in the ISAM keys themselves, which the application package is unable to remove. To assist you in removing unwanted records, a utility program is included in this recovery program. See page 15 for details of which files need to be run through the CLEANUP utility, and how to operate it on these or any other file.

9. HOW LONG TO GO
You will have noticed that the files are always dealt with in alphabetic order. Pages 12-14 have lists of the files so you can see which have or have not been processed at any one time; and with a hard copy of the directory at hand, you can make an estimate of the length of time left before completion.

1Ø. LENGTH
Some files will show fewer bytes AFTER the SAVEISAM program has finished with them. This is to be considered normal.

11. BUSTED BEYOND REPAIR
Occasionally an ISAM file will have garbage in the Header record (first 96 bytes of the file) or the Header record will be absent (shorter than 96 bytes). In either case, this SAVEISAM program will fail. It will most likely lock out the console and may even hang up the hard disk.

If you have a suspicion that the SAVEISAM program has hung up, then go to the DT1. This should be at the root prompt and root directory of course. If the response to:

```
l /t*
```

gives identical byte lengths for /tmporary.fil and /tmporary.dta over several attempts, inside a period of a minute or two, then your suspicions are confirmed. It has hung up!

In such cases, the customer must go back to earlier backups or start again.

Your XENIX system can be resuscitated by using the DT-1:

```
ps -alx <enter>
```

should allow you to identify the PID of the console process and the console's shell. Kill these processes then shutdown from the DT-1. On rebooting, such files as remain will appear under the directory:

```
/saveisam/Dta.Ø1/
```

12. Under certain circumstances, the SAVEISAM program will report Input/Output errors in /tmporary.fil, and in the hardcopy listing of it obtained when the program exits to XENIX. The line containing the error will have been given asterisks extending to the right of the normal entries. The asterisk marked line will contain the COBOL I/O error number which you should look up in the COBOL Development System manual. Attempt to identify the cause of the error, and if appropriate action can be taken to rectify it, then it may be possible to start the SAVEISAM process all over again with fresh copies of the files. Otherwise the customer's dataset is completely lost.

IN CASE OF DIFFICULTY

If there is an occasion during which this program reports error messages, or the customer's files do not appear to have been recovered successfully, then the following procedure should be adhered to:

1. STOP USING the ISAM RECOVERY PROGRAM IMMEDIATELY !!! Re-read this manual. Re-install the SAVEISAM programs. Satisfy yourself that all appropriate warnings and instructions have been followed. If there is any possibility of YOU having made a mistake, then re-try the procedure ONCE only.

2. As soon as possible, send to Customer Service in Fort Worth, the following:

a) A step by step account of the circumstances of the difficulty, including copies of ANY error messages obtained.
b) COPIES of the customer's software (not the originals), both before and after recovery.
c) A COPY of the original directory of the customer's disk.
d) Recursive hard copy of /Dta.Ø1, and /saveisam directories of YOUR primary hard-disk.
e) The PRINTOUT from the SAVEISAM program
f) Standard MEDIA SUBMISSION form.
g) Any other information which you consider will be useful in determining the cause of the difficulty.

The foregoing items should then be sent to:

Customer Relations Manager
Radio Shack Computer Customer Service
Dept. #7879
4ØØ Atrium
One Tandy Center
Fort Worth, Texas 761Ø2

3. Use the ISAM recovery program, ONLY in an attempt to recreate the failure, if you believe that there is a possibility of YOU having made a mistake.

4. WAIT for instructions from Fort Worth before attempting to continue normal use of the recovery program.

ALL DATA FILES FOR EACH PROGRAM ARE REQUIRED BEFORE RUNNING
==========

Ap #26-62Ø5
==

1	apactfil.dta
2	apadjtrx.dta
3	apchkfil.dta
4	apdisfil.dta
5	apopnfil.dta
6	aptrxdis.dta
7	aptrxfil.dta
8	apvenfil.dta

Ar #26-62Ø4
==

9	aractfil.dta
1Ø	arcdsfil.dta
11	arcomfil.dta
12	arcshapl.dta
13	arcshtrx.dta
14	arcusfil.dta
15	ardisfil.dta
16	arfchtrx.dta
17	aropnfil.dta
18	arselcst.dta
19	arsldtrx.dta
2Ø	arslmfil.dta
21	arslstrx.dta

Gl #26-62Ø1
==

22	glchart.dta
23	glfsspec.dta
24	glfswork.dta
25	glgjtrx.dta
26	gllayout.dta
27	glsaflof.dta
28	glsjtrx.dta
29	gltrxfil.dta
3Ø	gltxtfil.dta
31	glxrfwrk.dta

In		#26-63Ø2
==		
	32	inhead.dta
	33	inmaster.dta
	34	inpodtl.dta
	35	inrfle.dta
	36	invend.dta
Jb		#26-62Ø9
==		
	37	jbconmst.dta
	38	jbdetl.dta
	39	jbhstmst.dta
	4Ø	jbjobmst.dta
	41	jbtemp.dta
	42	jbtskmst.dta
Mi		#26-63Ø9
==		
	43	miinvent.dta
	44	miorder.dta
	45	miroute.dta
	46	mistruct.dta
Oe		#26-62Ø7
==		
	47	aractfil.dta
	48	oebocfil.dta
	49	oebocsel.dta
	5Ø	oeboifil.dta
	51	oeboisel.dta
	52	oeitmfil.dta
	53	oelinitm.dta
	54	oeordhdr.dta
	55	oerectrx.dta
	56	oesldtrx.dta
	57	oeslstrx.dta

Pr #26-62Ø3
==

```
58   practfil.dta
59   prchkfil.dta
6Ø   prdedcod.dta
61   prdedwrk.dta
62   prdisfil.dta
63   prdptwrk.dta
64   prempfil.dta
65   prhisfil.dta
66   prhrswrk.dta
67   prmandis.dta
68   prmantrx.dta
69   prqtdhis.dta
7Ø   prtaxcod.dta
71   prtimdis.dta
72   prtimtrx.dta
73   prunion.dta
74   prwrksht.dta
75   prytdhis.dta
```

CLEANUP UTILITY

This utility program will allow you to remove unwanted records from data files.

```
Ap          #26-62Ø5
==
      8     apvenfil.dta

Ar          #26-62Ø4
==
     14     arcusfil.dta
     15     ardisfil.dta
     17     aropnfil.dta

Gl          #26-62Ø1
==
     29     gltrxfil.dta

In          #26-48Ø2
==
     33     inmaster.dta

Oe          #26-62Ø7
==
     52     oeitmfil.dta
```

The CLEANUP utilities for these files are very important, and should be used as a matter of routine practice.

PURPOSE OF THE CLEANUP UTILITY

The above data files should ALWAYS be put through the first part of the cleanup program. This will allow you to identify records which need to be deleted from the ISAM file. You also have the opportunity to run through CLEANUP for any other file.

The first part of the cleanup program lists the keys of a specific file to the printer. If a key has illegal or unwanted characters in it, it is most likely that the regular pattern of the printout will be upset, i.e. the possibility that the lines are no longer regularly spaced and the columns no longer straight. If a record has picked up garbage in its keys, it should be possible for you to see alphabetic or special characters in normally numeric fields and so on.

On return of data files to the customer, he may complain of being unable to add, change or delete a particular entry, perhaps because a matching entry in another data file was damaged and could not be recovered. It will be possible to purge off such a record once it is identified.

Certain functions of our application packages, such as sales tax or freight, require a pre-defined account number in the valid GL account file and also in the control files of AP, AR, or OE. If such an account on a profit center is left undefined, then the application program creates a ØØØØ-ØØØ account number to which it posts. This is a built-in safeguard to ensure that a transaction is posted to both sides. The ØØØØ-ØØØ account on a profit center, once created, cannot be accessed by the application programs, but can be purged by the cleanup utility.

The second part of the process is simply the creation of a new copy of the data file, without those records which you have identified as needing to be purged.

LEARNING AND TESTING THE CLEANUP UTILITY

Before committing any customer's files to the cleanup process, you must first have run the recovery program on them. You should familiarize yourself with the way the cleanup process works as well.

You can use the sample data files to practice on.

The following is a sample session:

1. RECOVERY
The appropriate SAVEISAM recovery routines must have already been run.

2. BACKUP
Protect yourself, and your customer's files, by backing up to floppy. If you do not do so, and you inadvertantly purge off records that were valid, then the whole recovery routine will need to be started again from the beginning.

3. EXECUTE CLEANUP PROGRAM
At the console, at the root prompt and at the root directory type:

CLEANUP <enter>

4. MAIN MENU
As with SAVEISAM,

C
takes you to the main menu, and then type:

Q <enter>
which will exit to XENIX or the 3 digit code on the screen associated with the particular package.

For this sample session type:

APX
which will give us the Ap sub-menu 1

5. SUB-MENU 1
For each package, there is a sub-menu which allows access to EVERY ISAM file, through the number associated with that file. To cleanup apvenfil.dta type:

8 <enter>
The cleanup program for apvenfil.dta will ask us for a customer name then take us to the next sub-menu.

6. SUB-MENU 2
For each file there is another sub-menu, which allows:
1. LISTING of the file to the PRINTER.
2. PURGING of individual records.
9999. RETURN to the MAIN MENU

Ensure PRINTER is ON, ready, and has plenty of paper.
Type:

1 <enter>
to list to the printer.

A printed heading appears, giving the customer name, filename, then Record number, Primary key, and Alternate key. (NOTE: the number of alternate keys varies from file to file.)

If there are no records in the file, you will be returned to the SUB-MENU without further print-out.

The print-out will show the records that ISAM considers valid, from the present copy of the data file, together with a program-supplied record number. You will be returned to the SUB-MENU.

6. PURGE
In the sample file just printed, you should notice that the columns and rows are regular, and there appears to be no garbage in any of the keys.

Let us assume for the purpose of this sample session, that instead of:

```
1    ØØØ2ØØ                        ACME OFFICE SUPPLIES
2    ØØØ3ØØ                        RED LINE FREIGHT
```

we saw:

```
1      .*          E OFFICE S    . 2Ø2Ø2Ø2Ø2Ø2Ø
2    ØØØ3ØØ                        RED LINE FREIGHT
```

on the print-out, we would be safe in assuming that the first record needed to be purged.

In fact, bad records are very often concentrated at the beginning and end of the data files, with only a few in the middle.

To remove this "unwanted" record, type:

2 <enter>

A reminder of the need for a backup file is given on the screen, with <99> as a way back if you had forgotten to make it.

<enter>

takes us to the prompt:

REC # TO PURGE <99999> TO FINISH ____

We know record #1 is "unwanted", so type:

1 <enter>

The prompt will return. Assume we wish to purge off record #7 also, so type:

7 <enter>

When all bad records have been entered by the above means, type:

99999

to finish.

You will be prompted to examine the print-out, for correctness. The printer should have printed

1
7

Check these numbers against the print-out of the keys.
If they are incorrect, then type:

AGAIN

which will allow you to re-enter the whole thing.
Since we DO wish to purge record numbers 1 and 7, we can type:

PURGE

The printer will write the heading again, then the program will again list the data file to the printer, this time with PURGED ********** instead of records 1 and 7. At the same time, the new copy of the file will be created WITHOUT the "unwanted" records. At the end of this process, you will be returned to the SUB-MENU. Type:

1 <enter>

to satisfy yourself that the new copy of the file is in perfect shape. In this sample session, you will now have 5 not 7 records.
At the SUB-MENU type:

9999

to return to the MENU. At the MENU type:

Q <enter>

to return to TRS-XENIX

7. RETURN DATA FILES
Return the data file to new floppy media for the customer, together with the other data files for which no cleanup is needed, by appropriate means.

Keep the print-outs with the original media in a suspense file for a few weeks.

RESTRICTIONS OF CLEANUP UTILITY

1. ALL the RESTRICTIONS of the SAVEISAM recovery routine apply to CLEANUP as well.

2. NO data-file can have more than 9998 ISAM records.

3. ONLY 998 purges can be made in any one program run, although there is no restriction on how many times you may run one utility, should you need to purge thousands of records.

THE NEED FOR BACKUPS versus NEED FOR THIS PROGRAM

In an ideal situation, no customer would ever have crashed datafiles.

If a customer does have crashed datafiles, he ought to be able to go to his backup copies of the files, restore them, and be up and running again in no time at all.

If you educate ALL your users in the need for backups in numbers, and in depth, and persuade them that the only condition under which a backup should be destroyed (overwritten) is that the potential need for that backup is absolutely NIL, then this program will have no users at all.

In a real situation, however, this program will help your customer get going again with a minimum of effort, after a disastrous crash. But you should take the opportunity to voice concern about his backup procedures. The more important his datafiles are, the more frequently should he make backups, and the longer those backups should be archived. It would not be an exageration to say that twenty (yes 2Ø) or more backups at various stages would be well worthwhile. You need not necessarily make any more than the usual daily backup, but it's just that some of the backups made are intentionally archived for a longer period before putting them back into the backup cycle.